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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,644	02/19/2002	Nozomu Harada	219834US2S	2597
22850	7590	10/18/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			YE, LIN	
			ART UNIT	PAPER NUMBER
			2615	
DATE MAILED: 10/18/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/076,644

Applicant(s)

HARADA, NOZOMU

Examiner

Lin Ye

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 7-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION***Response to Arguments of Election/Restrictions***

1. Applicant's election with traverse of the election of invention in Group I (claims 1-6) in reply filed on 8/24/05 is acknowledged. The traversal is on the ground(s) that applicants believe that a search and examination of the entire application would not place a serious burden on the examiner, whereas it would be a serious burden on Applicant to prosecute and maintain separate applications. This is not found persuasive because the examiner made a *prima facie* showing of examining burden by pointing out the distinct inventions. For examples, **Group I** only teaches an image apparatus comprising an imaging device having a plurality of light-sensitive portions, which does not include a display apparatus comprising of a display arrange having a plurality of display pixels as claimed in **Group II**, and which does not include an image processing method which can provide or display an image in a resolution, which is higher than the number of physical pixels provided by light sensitive portions and display pixels in **Group III**. This same reasoning could be performed for all of the groups. See MPEP § 806.05(d).

The requirement is still deemed proper and is therefore made Final.

2. Claims 7-17 withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Group II and III, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in reply filed on 8/24/05.

Drawings

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3. The Figure 6 is objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: r₁ (See Applicant's specification page 22, line 6). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
4. Figures 8A and 8B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by the admitted prior art.

Regarding claim 1, the admitted prior art teaches in Figures 8A-8B, an imaging apparatus comprising: an imaging device having a plurality of light-sensitive portions arranged at least one-dimensionally or two-dimensionally (See applicant's specification page 1, lines 19-24), each light-sensitive portion (aperture 2) including an arbitrary number of fields (See applicant's specification page 4, lines 25-27 and page 5, lines 1-10); and a position control section which moves the relative positions of image points and the respective light-sensitive portions of the imaging device every field, wherein an effective aperture ratio of the light-sensitive portion is set so as to substantially minimize an aliasing distortion (less aliasing distortion) component at zero of spatial frequencies and at a Nyquist frequency (e.g., the number of spatial sampling points of the array in the horizontal pixel direction are raised to the value that is twice as much as the actual number of pixels, the effective aperture ratio of the pixel aperture is also raised; see page 5, lines 11-21; and also Figure 6, when $N=2$, it denotes a case to Figures 8A-8B, an aliasing distortion output can be set to zero at two points of zero of the spatial frequencies and the Nyquist frequency under two conditions of h_1 and

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r1, an image having a less aliasing distortion and a higher resolution can be obtained over a wide spatial frequency range, see page 21, line 20 through page 22, line 18).

Regarding claim 3, the admitted prior art teaches wherein the effective aperture ratio is determined on the basis of a physical aperture ratio of the light-sensitive portion (e.g., the effective aperture ration is twice as much as the basis of a physical aperture ration of the light sensitive portion as shown in Figures 8A-8B, See applicant's specification page 3, lines 1-5 and page 5, lines 11-21).

Regarding claim 4, the admitted prior art teaches wherein, the position control section vibrates the positions of the respective light-sensitive portions in each of the fields, and the effective aperture ratio is determined on the basis of a physical aperture ratio of the light-sensitive portion and the vibration of the light-sensitive portion in each of the fields as shown in Figure 8B (See applicant's specification page 4, line 15 through page 5, line 10).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3,5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, in view of Endo et al. U.S. Patent 4,652,928.

Regarding claim 3, the admitted prior art teaches all subject matter as discussed with respect to claim 1, except the admitted prior art does not explicitly show wherein the one frame of the imaging device includes four or more fields.

The Endo reference teaches in Figures 4A-4B and 10A-10B, providing a new and improved solid-state imager sensing device capable of attaining higher resolution by using at least four fields for one frame in a single vibration period (e.g., four fields A1, B1, A2 and B2 as four spatial sampling point are added to increase the resolution of the image, See Col. 5, lines 1-35 and Col. 6, lines 42-45). The Endo reference is evidence that one of ordinary skill in the art at the time to see more advantages the imaging apparatus using four fields for one frame in a signal vibration period instead of the two fields for one frame so that it is capable to attain higher resolution and realizing better image quality keeping false signals, such as moiré due to an aliasing distortion (See Col. 1, lines 55-68 and Col. 2, lines 1-2). For that reason, it would have been obvious to one of ordinary skill in the art to modify the image apparatus of the admitted prior art by providing the one frame of the imaging device includes four or more fields in a signal vibration period as taught by Endo ('928).

Regarding claim 5, the admitted prior art teaches all subject matter as discussed with respect to claim 1, and the admitted prior art teaches wherein the fields are formed so that a spatial phase at the position of the light-sensitive portion shifts 180° between the adjacent fields (e.g., as shown in Figure 8B, a cycle of a signal vibration period is 360° and includes A and B fields, so a spatial phase at the position of the light-sensitive portion shifts 180° between the adjacent fields such as A and B fields), except that the admitted prior art does not explicitly show a frame comprising four or more even-numbered fields every field.

The Endo reference teaches in Figures 4A-4B and 10A-10B, providing a new and improved solid-state imager sensing device capable of attaining higher resolution by using at least four fields for one frame in a single vibration period (e.g., four fields A1, B1, A2 and B2 as four spatial sampling point are added to increase the resolution of the image, See Col. 5, lines 1-35 and Col. 6, lines 42-45). The Endo reference is evidence that one of ordinary skill in the art at the time to see more advantages the imaging apparatus using four fields for one frame in a signal vibration period instead of the two fields for one frame so that it is capable to attain higher resolution and realizing better image quality keeping false signals, such as moiré due to an aliasing distortion (See Col. 1, lines 55-68 and Col. 2, lines 1-2). For that reason, it would have been obvious to one of ordinary skill in the art to modify the image apparatus of the admitted prior art by providing the one frame of the imaging device includes four or more fields in a signal vibration period as taught by Endo ('928).

Regarding claim 6, the admitted prior art and Endo reference discloses all subject matter as discussed with respected to claim 5, and the admitted prior art discloses wherein an effective aperture ratio of the light-sensitive portion is set so as to substantially minimize an aliasing distortion component at zero of spatial frequencies and at a Nyquist frequency. (e.g., the number of spatial sampling points of the array in the horizontal pixel direction are raised to the value that is twice as much as the actual number of pixels, the effective aperture ratio of the pixel aperture is also raised; see page 5, lines 11-21; and also Figure 6, when $N=2$ or 4, it denotes a case to Figures 8A-8B of admitted prior art or the Figures 4B and 10B of the Endo reference, an aliasing distortion output can be set to zero at two points of zero of the spatial frequencies and the Nyquist frequency under two conditions of $h1$ and $r1$, an image

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having a less aliasing distortion and a higher resolution can be obtained over a wide spatial frequency range, see page 21, line 20 through page 22, line 18).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. Endo et al. U.S. Patent 4,998,164 discloses the number of space sampling areas in the horizontal direction and during one color imaging frame period of the CCD becomes four.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lin Ye whose telephone number is (571) 272-7372. The examiner can normally be reached on Mon-Fri 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Lin Ye', with a stylized, flowing script.

Lin Ye
Examiner
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October 7, 2005